DNFSB/MISC -070

TESTIMONY ON THE INTEGRATED MANAGEMENT OF RESEARCH AND DEVELOPMENT SAFETY

Good morning, gentlemen. My name is Jan Preston, and I am the Deputy to the Assistant Director for Weapons Programs on the Board's Technical Staff.

Introduction:

Continuing with the theme of this series of hearings on standards-based safety management in the defense nuclear complex, this morning I will provide information on a Board initiative that was begun in 1994. This initiative focused on the integrated management of safety at the Department of Energy's weapons research and development facilities at the Los Alamos National Laboratory, the Lawrence Livermore National Laboratory, and the Sandia National Laboratories.

The Board began this review of safety management in the research and development (or "R&D") environment for a variety of reasons. The unique characteristics of nuclear R&D activities are well-known to the Board, including the fact that an environment that encourages R&D creativity cannot exist unless the management approach is flexible enough to permit the safe execution and control of a wide variety of activities. However, representatives of the weapons laboratories had voiced the opinion that DOE's actions to implement the Board's recommendations on standards were imposing unnecessary constraints on that flexibility. It was reported that requirements developed to provide appropriate levels of safety during the production of nuclear materials and nuclear weapons were being imposed without modification on R&D activities, which generally involve much smaller amounts of nuclear material in less frequent operations. Statements had been made that DOE's current compliance-focused safety management approach was not improving R&D operational safety; in fact, it had been asserted that safety was actually being negatively impacted in some situations by what was characterized as the "increased compliance burden." The Board decided to determine what had led to these assertions being made.

In the Board's second recommendation, Recommendation 90-2, DOE had been asked to address the adequacy of its health and safety standards and the extent of standards implementation in the DOE complex. DOE's response to this recommendation was to commit to the development of documents for defense nuclear facilities that "contain the standards and requirements necessary to operate facilities or conduct activities with adequate protection of workers, the public, and the environment" (*DOE Implementation Plan for Recommendation 90-2, Revision 5, November 1994*). As an interim measure, while these Standards/Requirements Identification Documents (or S/RIDs) were being developed, DOE had committed the facilities to assess their compliance with the safety requirements that were contained in the DOE Orders. Since facility-specific S/RIDs were intended to only include those requirements in DOE Orders and other sources that were determined to be applicable and necessary to adequately protect public health and safety, it was unclear why the labs were not succeeding in tailoring DOE's requirements appropriately for their operations.

Review Approach:

In October of 1994, the Technical Staff was directed by the Board to evaluate the current state of safety management at the weapons labs. Earlier attempts to elicit frank input from either the laboratories or from DOE on the problems the labs were experiencing had not been successful. Therefore, an additional objective of this new review effort was to begin to establish a more constructive dialogue with DOE and the weapons labs. It was decided that the review would include a small number of the Technical Staff members who were most familiar with the weapons laboratories, as well as a selected group of senior Outside Experts with extensive nuclear experience that was recognized and respected by the labs. I led the review team that included the three Technical Staff Program Managers for the weapons labs (Dr. Albert Jordan, for Los Alamos, Mr. Wayne Andrews, for Lawrence Livermore, and Mr. Donald Owen, for Sandia) and Dr. Gerald Tape, former Atomic Energy Commissioner, Mr. Duane Sewell, former DOE Assistant Secretary for Defense Programs and a former Deputy Director of Lawrence Livermore National Laboratory, and CAPT John Drain, U.S. Navy (retired), of System Planning Corporation.

This team decided to ask the labs to present their institutional approaches for creating and maintaining a safe working environment for R&D. This differed from a majority of past Staff review efforts, which had tended to focus on a specific area of compliance with DOE Orders, such as maintenance of safety equipment or training and qualification of workers, rather than on the integration of all safety management system elements.

We developed a proposed agenda that outlined this review approach; I will provide a copy for the record. We discussed this approach, after it was approved by the Board Members, with senior DOE Headquarters representatives from the Defense Programs organization and the Environment, Safety, and Health organization. The Assistant Secretary for Defense Programs, Dr. Victor Reis, formally endorsed and requested Field support for the Board's initiative in a letter to the Managers of the Albuquerque, Oakland, and Nevada Operations Offices; copies of this letter were transmitted to the three weapons laboratory heads, as well. I will also provide a copy of Dr. Reis' memorandum for the record.

The review team conducted technical interchanges in early 1995 at Lawrence Livermore National Laboratory on January 24th and 25th, at Los Alamos National Laboratory on February 14th and 15th, and at the Sandia National Laboratories' New Mexico site on February 16th. Each of these interchanges involved representatives from DOE Headquarters, from the DOE Operations Offices and Area Offices, and from the two other weapons laboratories. Each laboratory committed considerable technical and management resources to support these interchanges; this ensured a highly beneficial technical exchange.

Review Results:

The review team discussed R&D safety management at each laboratory with senior laboratory safety managers, with professional environment, safety, and health (ES&H) staff, with nuclear

facility managers, and with the researchers themselves. We were briefed on each lab's existing approach to safety management and then discussed a spectrum of potential enhancements that ranged from minor desired changes (either at the laboratory or within DOE) to completely new, "clean slate" proposals.

Laboratory personnel universally stated that they were required to spend much more time today on what they characterized as "compliance" activities than they had in the past. They believe that increased administrative compliance assessment demands reduce both the amount of time available for researchers to conduct R&D and for ES&H staff to provide safety guidance and support for activities in the facilities. Examples of the compliance duties most frequently cited during our discussions included meeting DOE's commitment to the Board to conduct Order Compliance Self-Assessments and laboratory personnel support to frequent (and what were characterized as uncoordinated) external audits.

One of the greatest frustrations expressed by laboratory personnel was with their inability to obtain approval for exemptions from DOE Order requirements that they did not believe to be either applicable, technically appropriate, or justified from the standpoint of the amount of risk reduced when compared to the cost. This apparent difficulty in getting DOE to approve exceptions was attributed to several factors: according to lab personnel, DOE is not perceived to have sufficient technically competent staff assigned to the task; a clear set of acceptance criteria for determining whether an exception request is appropriate does not exist; and there is a reported widespread misperception within the DOE complex that the Board will view less-than-literal compliance with all safety-related requirements and guidelines as unacceptable.

Because of the nature of the work (in other words, the uncertainty inherent in the experimentation process), an integrated safety management system is essential for nuclear R&D facilities. These management systems must integrate traditional nuclear facility control (in other words, the definition, maintenance, and operation of structures, systems, and components important to safety) with comprehensive review and control of the hazards introduced into the facility by the experimental activities themselves. We found that there is great variability, today, in the way that the laboratories manage both their facility safety and the safety of their R&D activities, and in the extent to which these management efforts are integrated. The laboratories are at various stages of developing integrated "Standards-based Safety Management Systems." Although the S/RIDs process was developed to support the tailoring of standards and requirements to each facility, the laboratories generally expressed a lack of support for this DOE program, at least in the form in which it was committed to the Board.

The review team reported on the results of the technical interchanges at the weapons laboratories in a written report and in a briefing to the Board. I will provide a copy for the record of our final report to the Board.

Board Action:

The Board issued a letter to the Secretary of Energy on April 28, 1995, that transmitted a reporting requirement on the subject of "Safety in the R&D Environment"; the review team's report was also enclosed with this letter. I will provide a copy of the April 28th reporting requirement for the record.

In the April 28th letter, the Board reiterated the need for a disciplined approach to facility operations, including operations at laboratory R&D facilities, to protect workers, the public, and the environment, and to assure that an accident does not render a facility useless for national security-related activities. The Board noted the differences between R&D and production activities, including the need for R&D experiment control systems, in addition to traditional facility safety management mechanisms. The Board also noted that several mechanisms already exist to allow the tailoring of integrated safety management systems, but acknowledged that the laboratories still report having difficulty exercising these mechanisms. The Board requested that DOE provide a report that addresses three issues: (1) the adequacy of the guidance given by DOE on the development of integrated safety management systems; (2) how DOE will provide adequate technical talent, mechanisms, and acceptance criteria to review and expeditiously approve tailored integrated safety management systems (including the appropriate disposition of exemptions); and (3) what is needed to better coordinate DOE safety audits. The Board requested this report within 90 days of the Secretary's receipt of the April 28th letter.

Progress, to date, in Responding to the Board's Letter:

On May 25th, the Board met with senior DOE management from the Defense Programs Organization, the Albuquerque Operations Office, and the Oakland Operations Office, and with the heads of the three weapons laboratories. The basis for the Board's R&D Safety reporting requirement was discussed at this meeting. During the meeting, the Manager of the Albuquerque Operations Office, Mr. Bruce Twining, assumed the responsibility to coordinate DOE's response to the Board's reporting requirement, and promised close cooperation with the weapons laboratories for the preparation of the response.

Since the May 25th meeting, Board Members have also traveled to each weapons laboratory to discuss the issue of integrated, standards-based safety management for R&D with that laboratory's Director, or President, as is the case for Sandia. During these meetings, the Board Members have continued to challenge each weapons laboratory to develop an appropriately tailored safety management system for their R&D activities, and have stressed their intention to encourage DOE to resolve the issues identified in the April 28th letter associated with establishing a technically-based and rational review and approval process for these laboratory proposals.

The Albuquerque Operations Office-led working group charged with drafting the DOE response to the reporting requirement consists of representatives from DOE Headquarters and the field offices, and from Los Alamos, Lawrence Livermore, and Sandia. The entire working group

has met twice, including last week in Albuquerque, and has had approximately twice-weekly working conference calls. The working group indicated last week that Mr. DiNunno's technical paper that was provided at the last hearing of this series, entitled "Fundamentals for Understanding Standards-Based Safety Management of DOE Defense Nuclear Facilities" (*DNFSB/TECH-5*) has contributed significantly to their discussion of the issues.

DOE perceives that the report being prepared in response to the Board's April 28th reporting requirement provides an opportunity that is broader than the specific obligation to address the three issues that the letter contained, and which I mentioned earlier. This is evidenced by a June 9, 1995 memorandum from Bruce Twining to Dr. Everet Beckner, the Principal Deputy Assistant Secretary for Defense Programs. Quoting from the Twining memorandum, which I will provide for the record:

> *"The development of this report is extremely important to continuing the missions of the laboratories while efficiently ensuring the safety of the workers, public and the environment. I believe this report provides DOE and the laboratories with the unique opportunity to create model Management Systems that integrate Environment, Safety, and Health (ES&H) at each laboratory. These laboratory management models will meet laboratory management requirements while meeting DOE responsibilities and DNFSB expectations."*

It is our understanding that DOE and the laboratories intend to take advantage of this *"unique opportunity"* by using the report requested by the Board on April 28th to ultimately lay out individual plans of action for the development of tailored, standards-based safety management systems for the laboratories. Work on the report by both the DOE and the laboratories continues at this time. Based on the meeting last week in Albuquerque, it appears likely that DOE may request a short extension of the Board's requested late-July submittal date for the report. I am now prepared to respond to questions, if there are any.